Claims:

1. A method of estimating a satellite signal parameter in a satellite positioning system receiver, comprising:

generating a plurality of correlation results between a satellite signal and a reference signal in response to a command from a processor;

estimating at least one satellite signal parameter from the plurality of correlation results using a co-processor integrated within the satellite positioning system receiver; and

providing the at least one satellite signal parameter to the processor.

2. The method of claim 1, further comprising:

estimating at least one receiver parameter using the at least one satellite signal parameter.

3. The method of claim 1, wherein the plurality of correlation results comprises a correlation history defined by at least one sequence of correlation results corresponding to a respective at least one relative time delay between the satellite signal and the reference signal.

4. The method of claim 3, wherein the at least one satellite signal parameter comprises a Doppler offset for the satellite signal relative to the satellite positioning system receiver.

5. The method of claim 4, wherein the estimating step comprises:

computing a plurality of complex cross-products using the correlation history; and

combining the complex cross-products to compute the Doppler offset.

6. The method of claim 5, wherein the estimating step further comprises:

frequency correcting the correlation history using the Doppler offset; and

repeating the computing step and the averaging step using the

frequency corrected correlation history to re-compute the Doppler offset.

7. The method of claim 5, wherein the estimating step further comprises:
integrating the correlation history over a pre-defined interval.

8. The method of claim 4, further comprising:
estimating a frequency of an oscillator in the satellite positioning system receiver in response to the Doppler offset.

9. The method of claim 3, wherein the at least one satellite signal parameter comprises navigation data bits.

10. The method of claim 9, wherein the estimating step comprises:
computing a plurality of complex dot-products using the correlation history; and
thresholding the plurality of complex dot-products to identify phase transitions within the correlation history.

11. The method of claim 10, wherein the estimating step further comprises:
frequency correcting the correlation history using a Doppler offset.

12. The method of claim 10, wherein the estimating step further comprises:
integrating the correlation history over a pre-defined interval.

13. The method of claim 3, wherein the at least one satellite signal parameter comprises a navigation bit timing of the satellite signal.

14. The method of claim 13, wherein the estimating step comprises:
determining, in response to the correlation history, a plurality of estimates of signal level using one or more receiver frequency and bit timing hypotheses.

15. The method of claim 13, wherein the estimating step comprises:
computing a plurality of complex dot-products using the correlation

history;

selecting a bit-timing offset;

summing complex dot-products from the plurality of complex dot-products that correspond to the selected bit timing offset; and

repeating the selecting step and the summing step for a plurality of bit-timing offsets to form a histogram.

16. The method of claim 15, wherein the estimating step further comprises:

frequency correcting the correlation history using a Doppler offset.

17. The method of claim 15, wherein the estimating step further comprises:

integrating the correlation history over a pre-defined interval.

18. The method of claim 13, further comprising:

estimating a timing error associated with the satellite positioning system receiver using the navigation bit timing.

19. The method of claim 1, wherein the at least one satellite signal parameter comprises at least one noise statistic measurement associated with the satellite signal.

20. The method of claim 1, further comprising:

using the at least one satellite signal parameter to configure the satellite positioning receiver when performing further correlations.

21. The method of claim 1, wherein the generating step comprises storing the plurality of correlation results in a memory within the satellite positioning system receiver.

22. An apparatus for estimating a satellite signal parameter in a satellite positioning system receiver, comprising:

a correlator for generating a plurality of correlation results between a satellite signal and a reference signal in response to a command from a processor;

a co-processor, integrated within the satellite positioning system receiver, for estimating at least one satellite signal parameter from the plurality of correlation results; and

means for providing the at least one satellite signal parameter to the processor.

23. The apparatus of claim 22, further comprising:

a memory for storing the plurality of correlation results.

24. The apparatus of claim 22, wherein the co-processor comprises at least one of:

a complex modulator for frequency correcting the plurality of correlation results;

a complex power unit for computing power in response to the plurality of correlation results;

a complex cross-product unit for computing complex cross-products in response to the plurality of correlation results;

a complex dot-product unit for computing complex dot-products in response to the plurality of correlation results;

a coherent integration unit for coherently integrating the plurality of correlation results;

a non-coherent integration unit for non-coherently integrating the plurality of correlation results; and

a noise statistics unit for determining noise statistics in response to the plurality of correlation results.

25. The apparatus of claim 22, wherein the plurality of correlation results comprises a correlation history defined by at least one sequence of correlation results corresponding to a respective at least one relative time delay between the satellite signal and the reference signal.

26. The apparatus of claim 25, wherein the co-processor is adapted to:

compute a plurality of complex cross-products using the correlation history; and

combine the complex cross-products to compute a Doppler offset.

27. The apparatus of claim 26, wherein the co-processor is further adapted to:

frequency correct the correlation history using the Doppler offset; and

re-compute the Doppler offset in response to the frequency corrected correlation history.

28. The apparatus of claim 26, wherein the co-processor is further adapted to:

integrate the correlation history over a pre-defined interval.

29. The apparatus of claim 25, the co-processor is adapted to:

compute a plurality of complex dot-products using the correlation history; and

threshold the plurality of complex dot-products to identify phase transitions within the correlation history.

30. The apparatus of claim 29, wherein the co-processor is further adapted to:

frequency correct the correlation history using a Doppler offset.

31. The apparatus of claim 29, wherein the co-processor is further adapted to:

integrate the correlation history over a pre-defined interval.

32. The apparatus of claim 25, wherein the co-processor is adapted to:

compute a plurality of complex dot-products using the correlation history;

select a bit-timing offset;

sum complex dot-products from the plurality of complex dot-products that correspond to the selected bit timing offset; and

repeat selection and summation for a plurality of bit-timing offsets to form a histogram.

33. The apparatus of claim 32, wherein the co-processor is further adapted to:

frequency correct the correlation history using a Doppler offset.

34. The apparatus of claim 32, wherein the co-processor is further adapted to:

integrate the correlation history over a pre-defined interval.

35. The apparatus of claim 22, wherein the co-processor is adapted to compute at least one noise statistic in response to the plurality of correlation results.